

### **Amendments to the Claims:**

Claims 1 - 46 cancelled

47. (Currently Amended) An optical examination device for *in vivo* examination of biological tissue, comprising:

an optical source for emitting light in the visible to infrared range and an optical detector for detecting light;

an array of optical fibers including end portions freely protruding from a support and arranged for engaging the scalp or skin of a subject at distal ends of said fibers, said optical fibers including proximal ends arrayed for coupling light from ~~[[between]]~~ said light source into source fibers and for coupling light from detector fibers into said optical detector by indexing in space fiber locations with respect to tissue positions corresponding to said distal ends ~~of said end portions~~ engaging the scalp or skin of said subject; and

a controller constructed and arranged to control operation of said light source and said optical detector and control introduction and detection of light at said arrayed proximal ends.

48. (New) The optical examination device of claim 47 further including means for directing light into the fiber.

49. (New) The optical examination device of claim 47 in which the fibers are single mode fibers.

50. (New) The optical examination device of claim 47 in which the fibers are resiliently flexible laterally to bend and conform a pattern of fiber tips to variations in the shape of the skull, breast or other portion of the body.

51. (New) The optical examination device of claim 47 in which the freely extending end portions of the fibers have a length to diameter ratio of between about 5

and 200.

52. (New) The optical examination device of claim 51 in which the ratio is between about 20 and 150.

53. (New) The optical examination device of claim 52 in which the ratio is between about 50 and 125.

54. (New) The optical examination device of claim 47 in which the free end portions of the optical fibers have diameter of the order of 0.1 to 3.0 millimeter and have a length between about 0.5 to 3 cm.

55. (New) The optical examination device of claim 54 in which the free end portions of the optical fibers have diameter of about 0.2 to 0.5 millimeter and length between about 1 and 2.5 cm.

56. (New) The optical examination device of claim 47 constructed as a handheld probe, and being sized and configured to be moved and placed against the breast.

57. (New) The optical examination device of claim 47 constructed as a handheld probe, and being sized and configured to be moved and placed against the head.

58. (New) The optical examination device of claim 47 wherein said distal ends of said fibers are constructed for placement against the head.

59. (New) The optical examination device of claim 47 wherein said distal ends of said fibers are constructed for placement against the breast.

60. (New) The optical examination device of claim 58, wherein the end portions of the fibers have smooth, enlarged tips adapted to comfortably engage the scalp.

61. (New) The optical examination device of claim 58, wherein said optical fibers are arranged with respect to said support to transmit selected pressure in a resiliently compliant manner.

62. (New) The optical examination device of claim 59, wherein the end portions of the fibers have smooth, enlarged tips adapted to comfortably engage the scalp.

63. (New) The optical examination device of claim 59, wherein said optical fibers are arranged with respect to said support to transmit selected pressure in a resiliently compliant manner.

64. (New) The optical examination device of claim 47, including a disposable protective element adapted for engagement with the skin or scalp.

65. (New) The optical examination device of claim 62, wherein said disposable protective element includes an end cup or sleeve disposably surrounding said distal end of said optical fiber freely protruding as a cantilever from a support.

66. (New) The optical examination device of claim 62, wherein said disposable protective element is used with a dispenser constructed to apply several said disposable elements to said distal end.

67. (New) The optical examination device of claim 64, wherein multiple end caps or sleeves are held in alignment by said dispenser in position to be entered by corresponding fibers by juxtaposition of said dispenser with the corresponding fibers.